

IMST GmbH

Inspiring **M**obile & **S**atellite Communication
Technologies



Kamp-Lintfort, Germany

Your High-Tech Workbench

6G-IA Brokerage event – January 2024

Matthias Schneider & Christos Oikonomopoulos



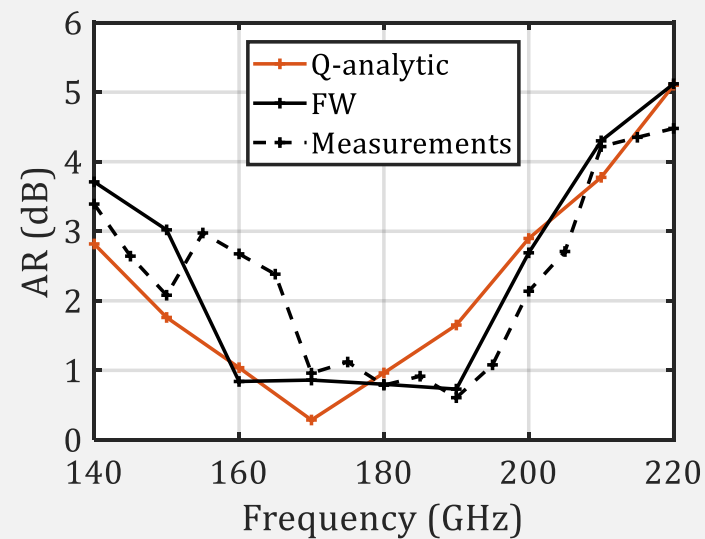
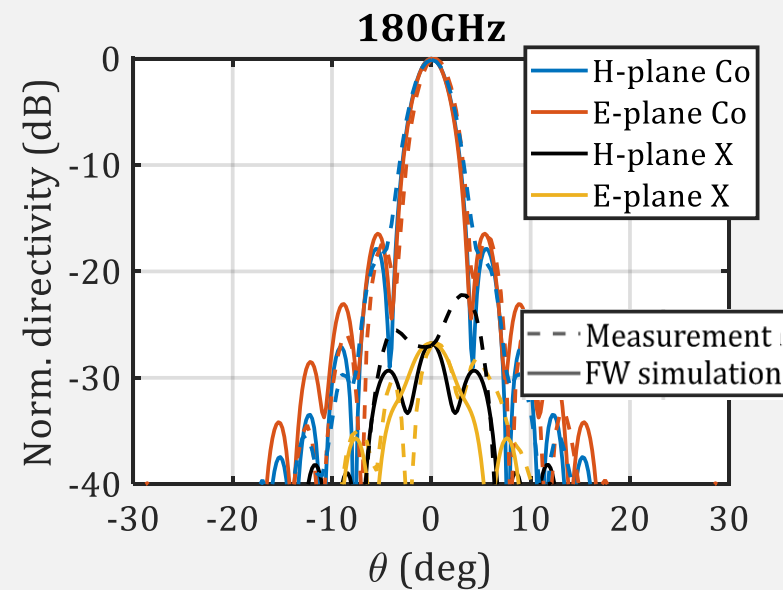
IMST GmbH in Facts & Figures

- Founded 1992
- Kamp-Lintfort
- 3 x Anechoic Chamber
- Employees 180
- From 18 Nations
- 1.500 sqm Laboratories

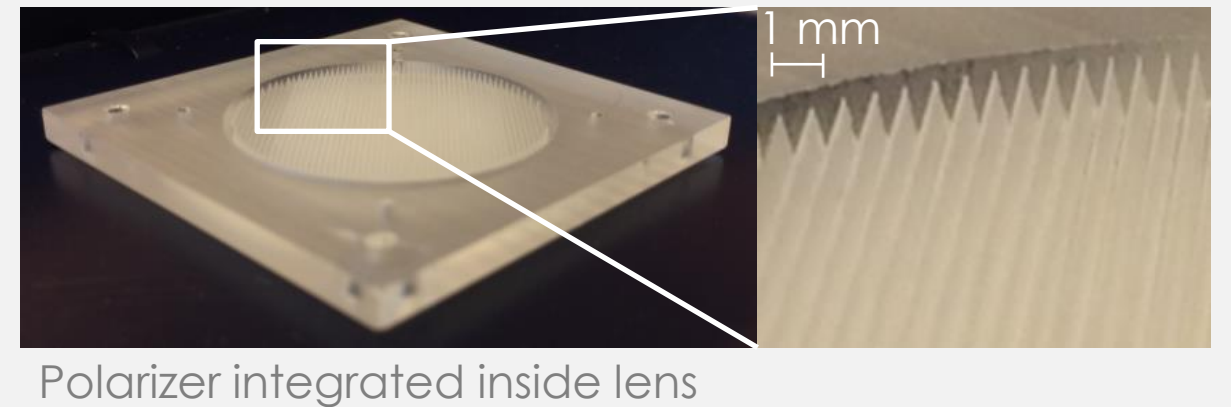
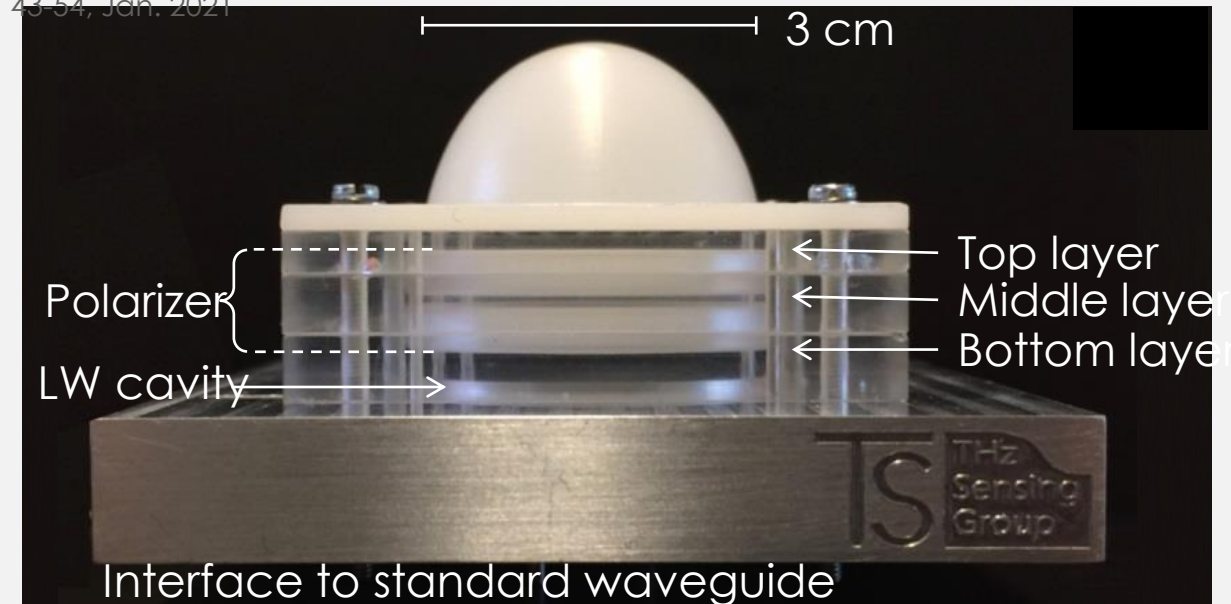


Sub-THz circularly-polarized lens antenna

- High-Density PolyEthylene (HDPE)-Topas lens
- Frequency: 140 GHz – 220 GHz
- Wideband circular polarization
- Gain > 30 dB, losses < 0.7 dB
- Aperture efficiency > 80%

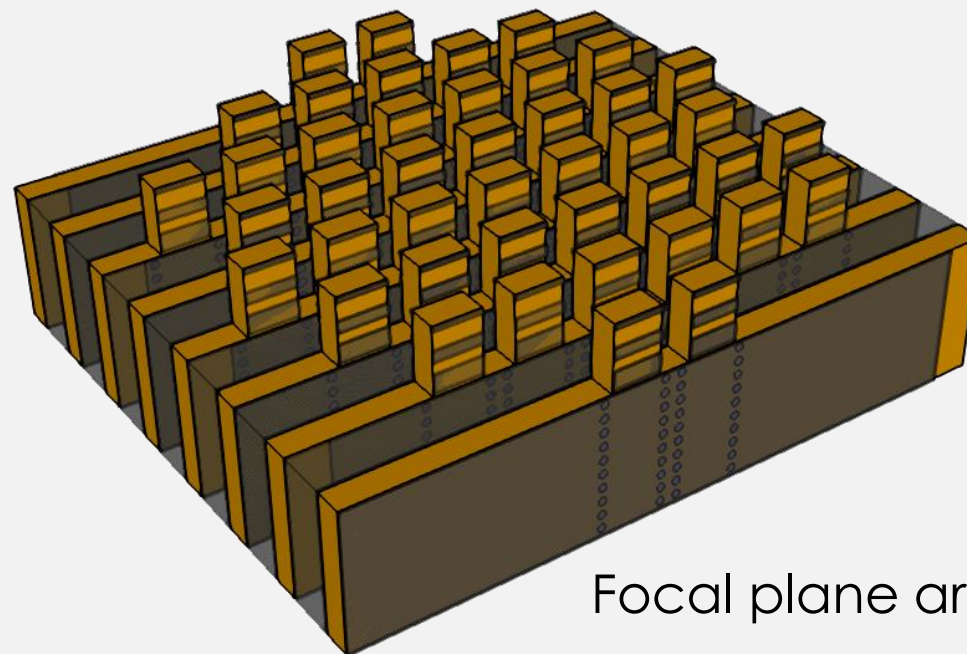


M. Arias Campo et al., "Wideband Circularly Polarized Antenna With In-Lens Polarizer for High-Speed Communications," in *IEEE Trans. Antennas Propag.*, vol. 69, no. 1, pp. 43-54, Jan. 2021

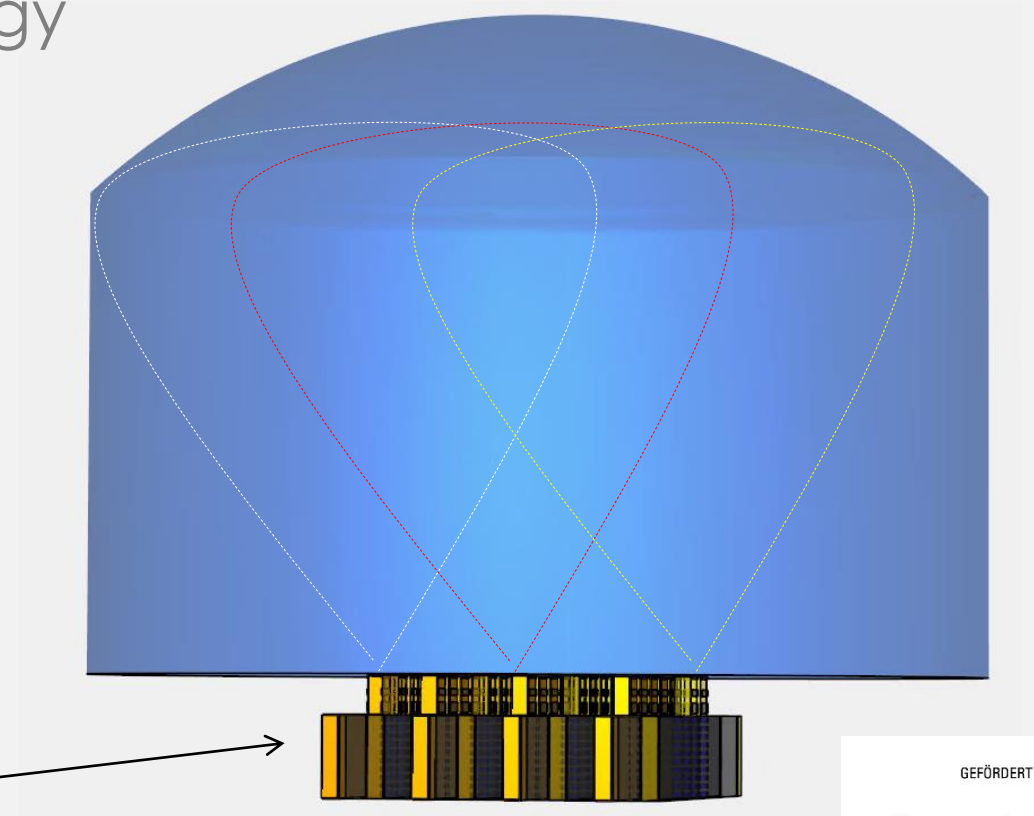


D-band active focal plane array

- Frequency: 140 GHz – 160 GHz
- Substrate Integrated Waveguide (SIW) technology in brick architecture
- $\pm 45^\circ$ 3D beam steering
- Communications application
- On-going project



Focal plane array



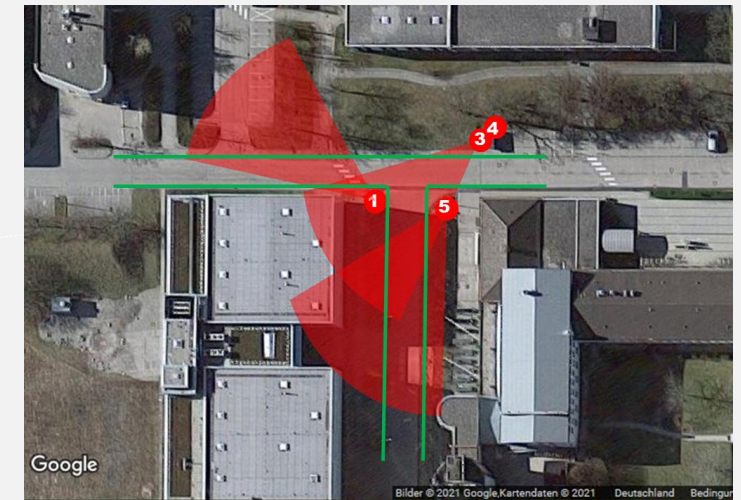
Radar and Sidelink Development

77 GHz Radar Roadside Unit

- Frequency: ~77 GHz
- With Communication Interface
- Sensor Network
- On-going project

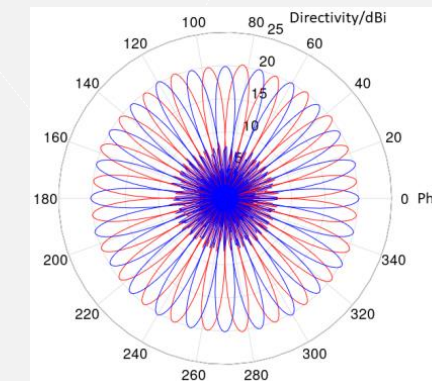
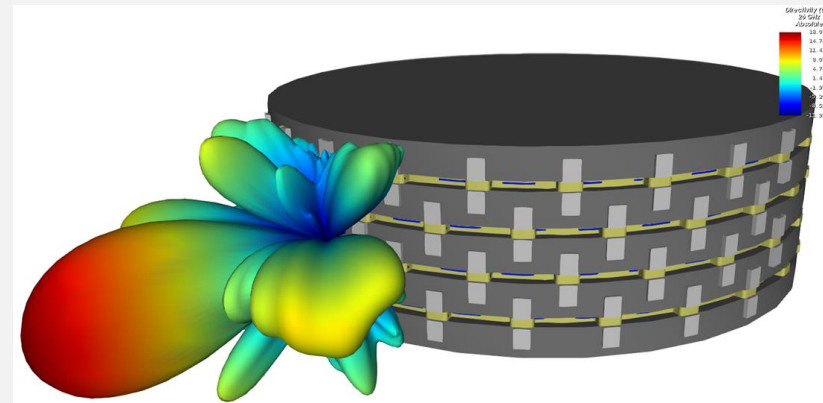


Project: VIDETEC



MMW Sidelink Module

- Frequency: ~26 GHz
- brick architecture
- 3D beam steering
- JCAS application
- On-going project



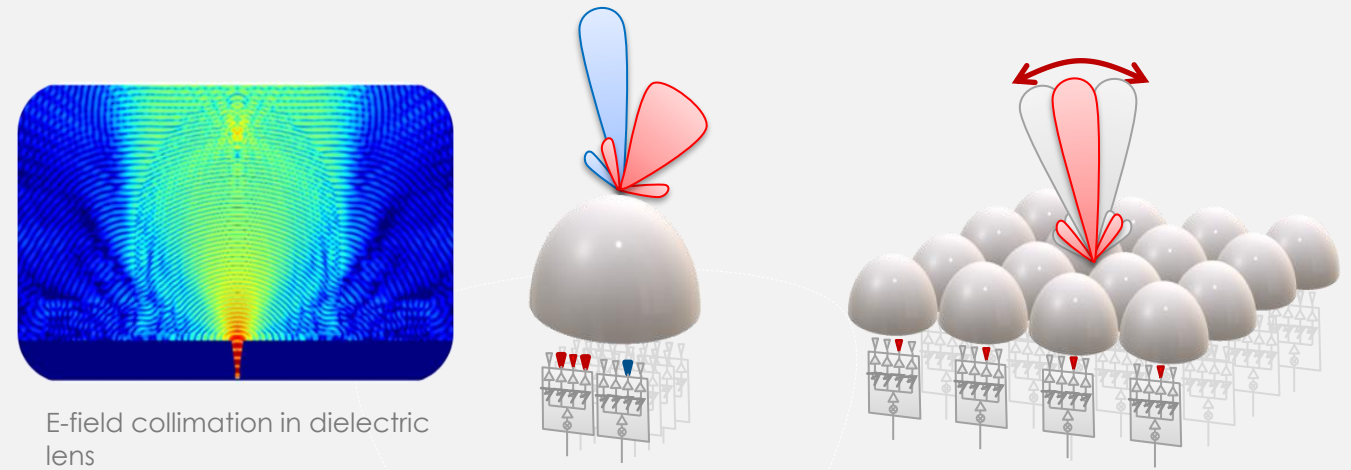
6G-ICAS4Mobility



D-Band JCAS Hardware

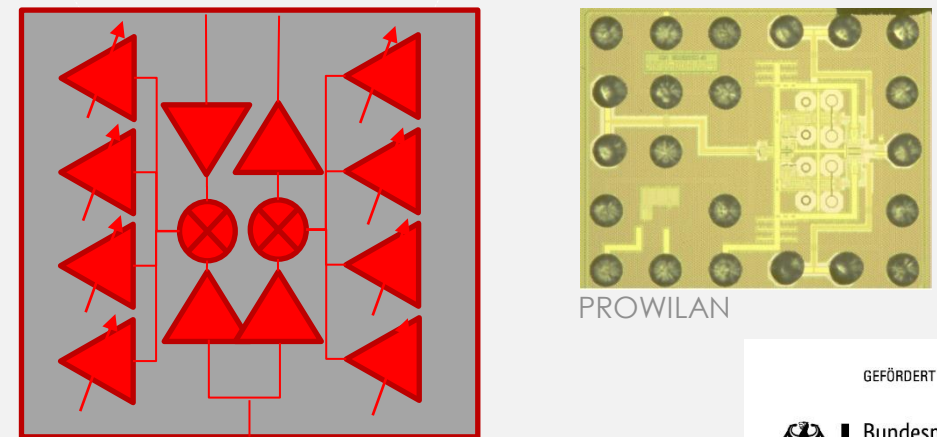
D-band Lens Array

- Frequency: 140 GHz – 160 GHz
- beam steering
- Communications application
- On-going project



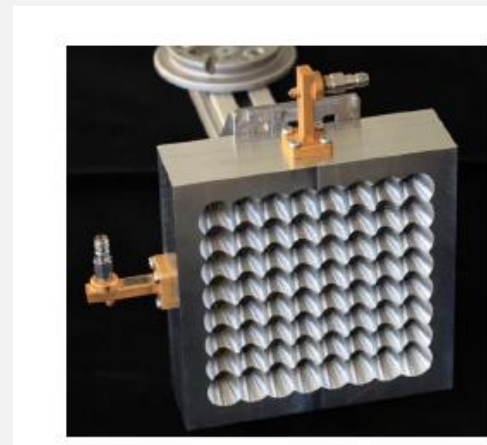
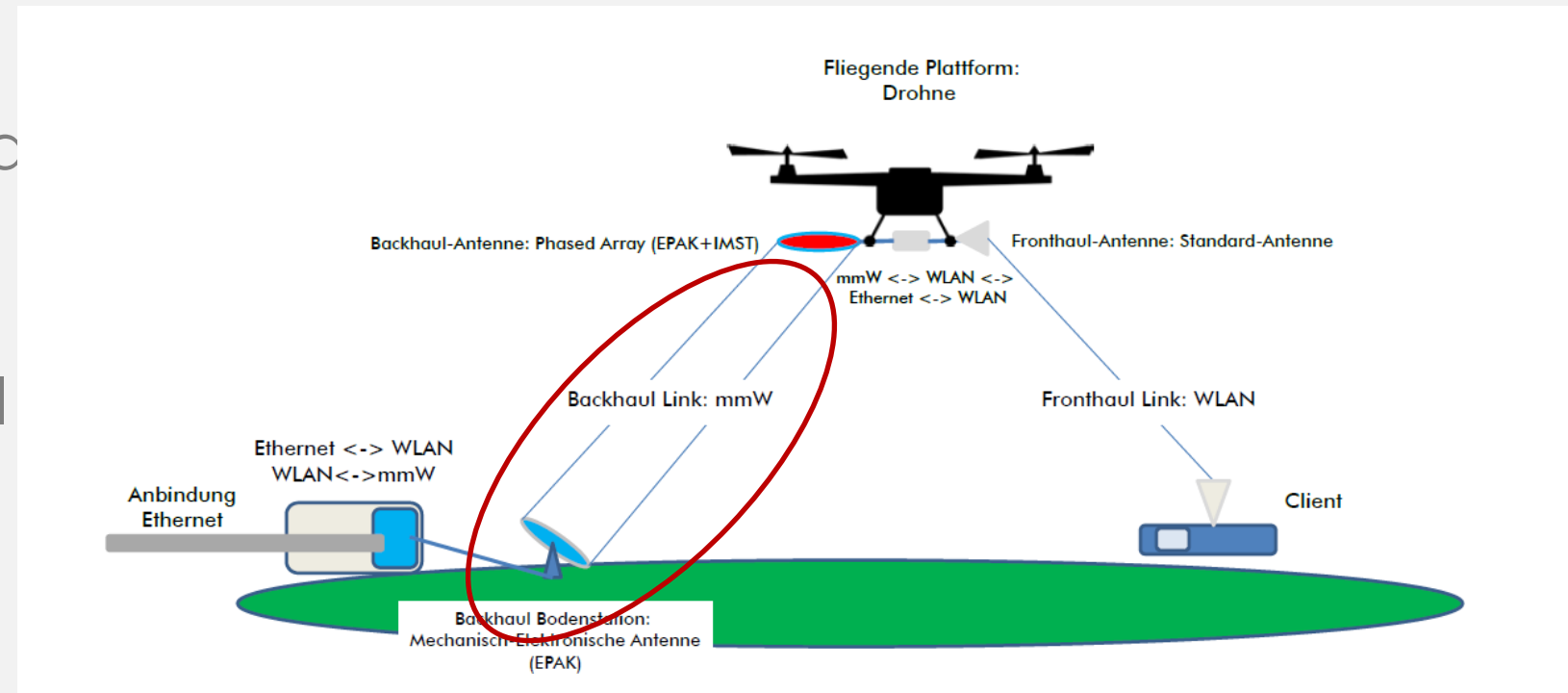
D-band Beamformer IC

- Frequency: 140 GHz – 155 GHz
- 4 TX and 4 RX Channels
- Mixer integrated, <20 GHz LO
- On-going project



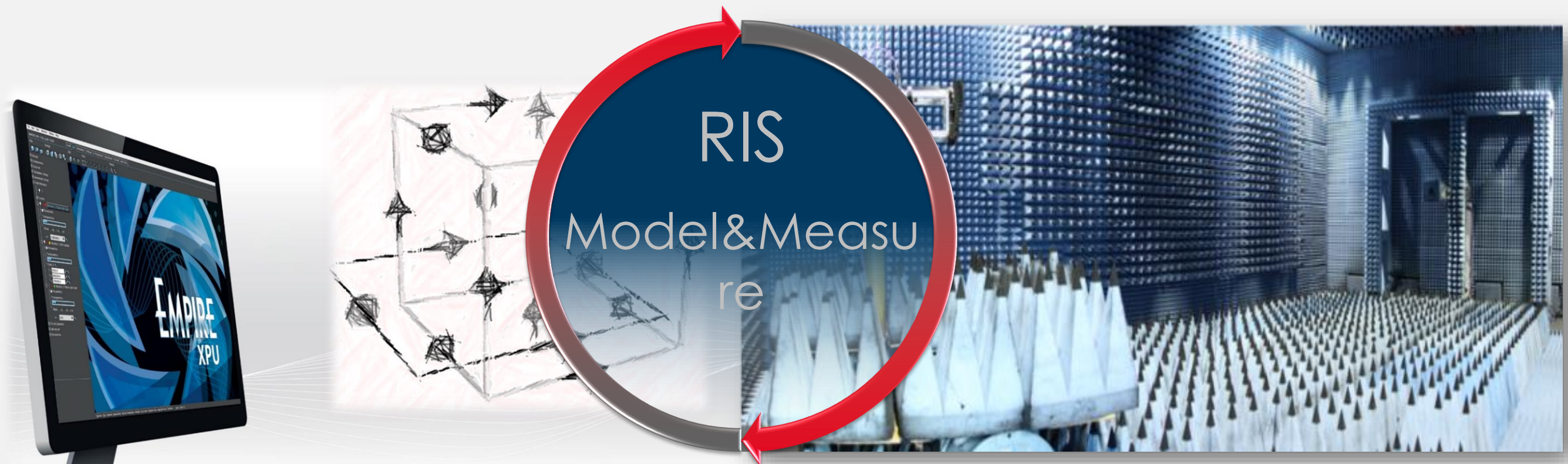
High Datarate Backhaul Link

- Frequency: 31 GHz
- Combined electrical (UAV) and mechanical beam steering (ground)
- Airborne phased array terminal
- Communications application
- On-going project



Model & Measure of RIS „antennas“

- Simulation of reconfigurable intelligent surfaces
- Characterization of reconfigurable surfaces



6G-LICRIS

GEFÖRDERT VOM

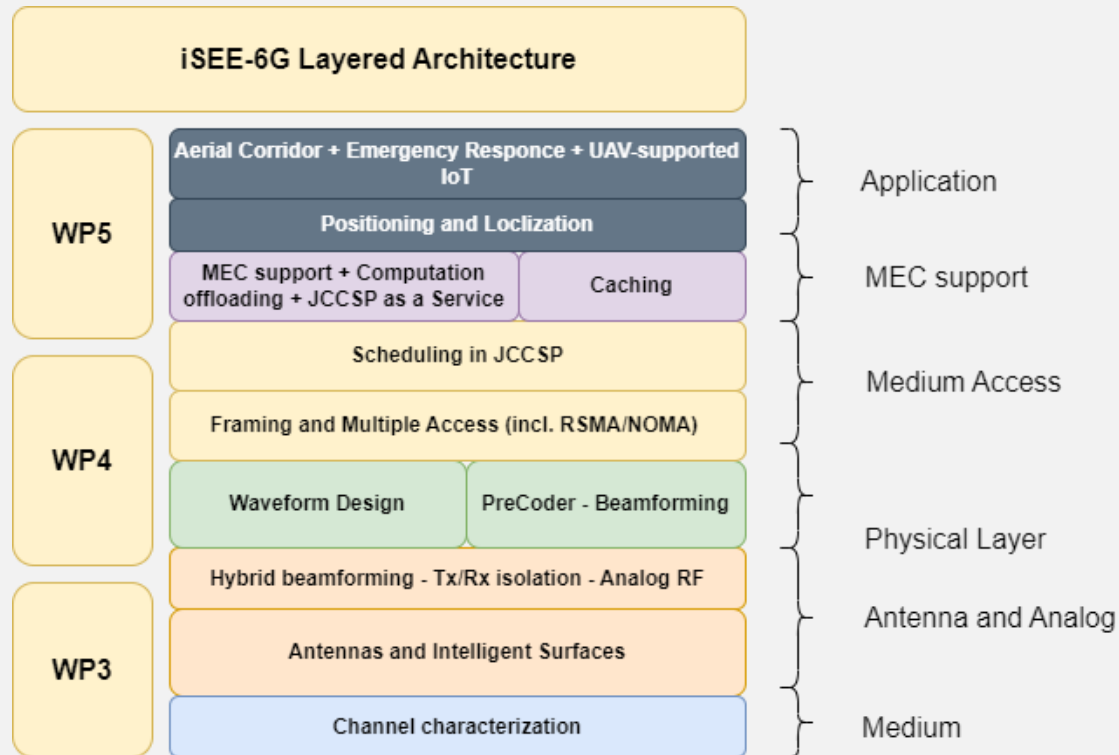
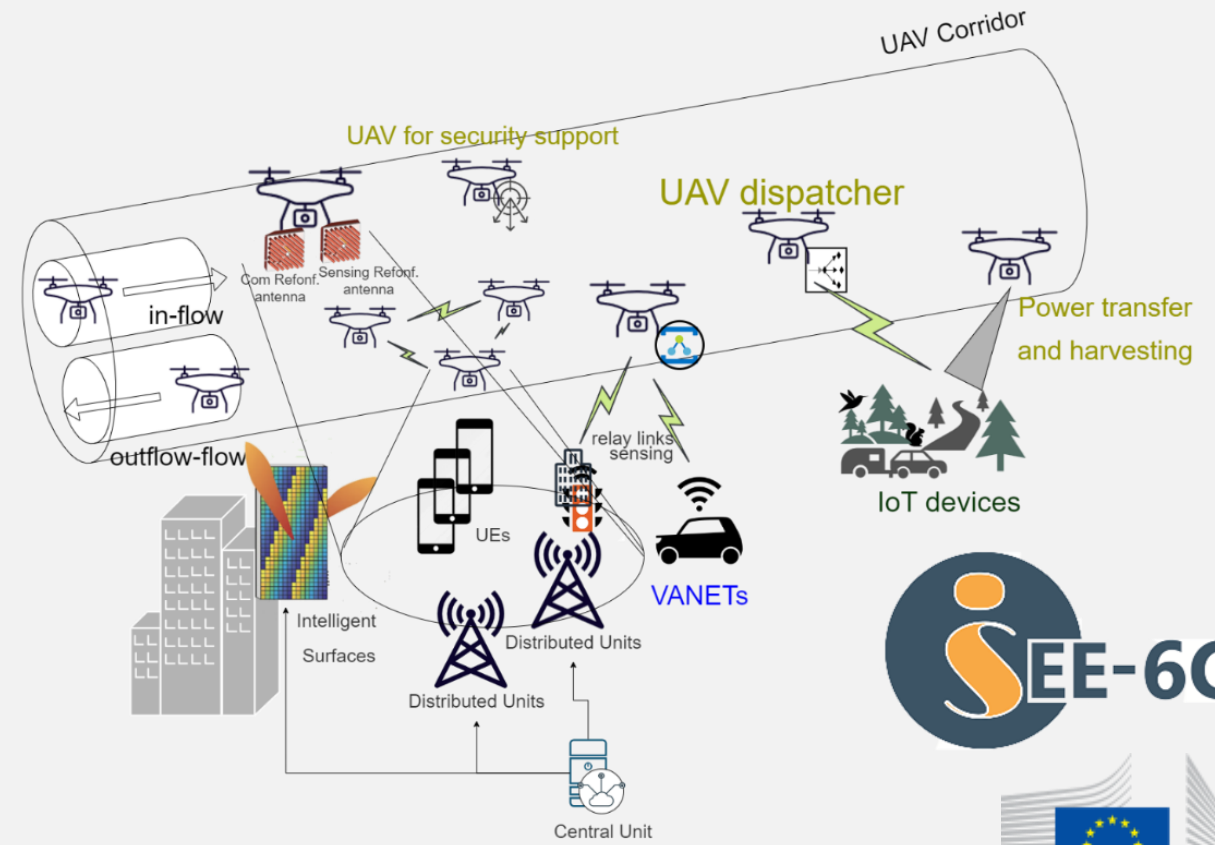


Bundesministerium
für Bildung
und Forschung



Integrated Sensing, Energy and Communication

- Beyond joint communication and sensing
- Definition & development of Joint Communication, Computation, Sensing, and Power transfer (JCCSP) unified radio paradigm



- Use Case: 6G-enabled/supported Aerial Corridors
- JCCSP-oriented passive and active antennas solutions with intelligent reconfiguration capabilities
- JCCSP-optimized Physical Layer design
- JCCSP-enabled cross-layer schemes design
- Positioning with MEC support using 6G and UAVs network.



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